

St Johnsbury BF 7000(20) Bridge 6 on VT Route 2B over the Lamoille Valley Rail Trail Regional Concerns Meeting



**Presented by
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[illegible]

ST. JOHNSBURY,
VT 2B, BR 6.

Meeting Outline

- Purpose of the Meeting
- Structures Section Re-organization
- Existing bridge deficiencies
- Alternatives considered
- Summary and recommendation
- Next Steps

Purpose of Meeting

- Present the alternatives that we have considered
- Explain the constraints to the project
- Help you understand our approach to the project
- Provide you with the chance to ask questions
- Provide you with the chance to voice concerns
- Build consensus for the recommended alternative-

Accelerated Bridge Program

- Began in January 2012
- Bridges are deteriorating faster than we can fix them
- Short-term closures are key
- Impacts to property owners and resources is minimized
- Less impacts = less process = less money = faster delivery
- Accelerated Bridge Construction (ABC) is very efficient
- Accelerated Project Delivery is the result
- Shift from individual projects to programmatic approach
- Goal of 25% of projects into Accelerated Bridge Program
- Goal of 2 year design phase for ABP (5 years conventional)

Project Initiation & Innovation Team

- Part of re-organization in January 2012
- All Structures projects will begin in the PIIT
- Very efficient process
- Look for innovative solutions whenever possible
- Involved until Project Scope is defined
- Hand off to PM to continue Project Design phase

Phases of Development

Project
Funded

Project
Defined

Contract
Award

Project Definition

Project Design

Construction

Identify resources &
constraints

Evaluate alternatives

Public Participation

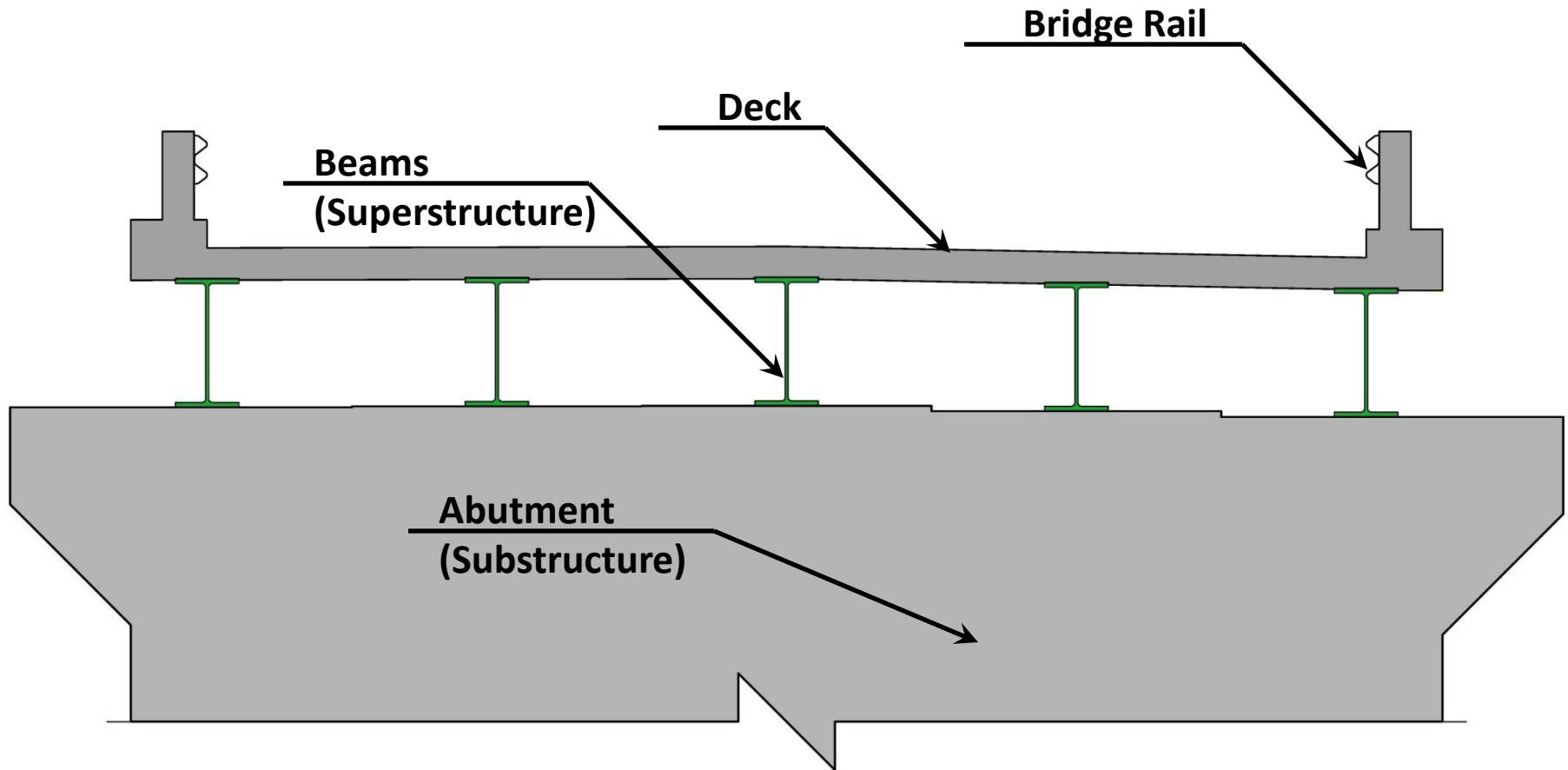
Build Consensus

- Quantify areas of impact

- Environmental permits

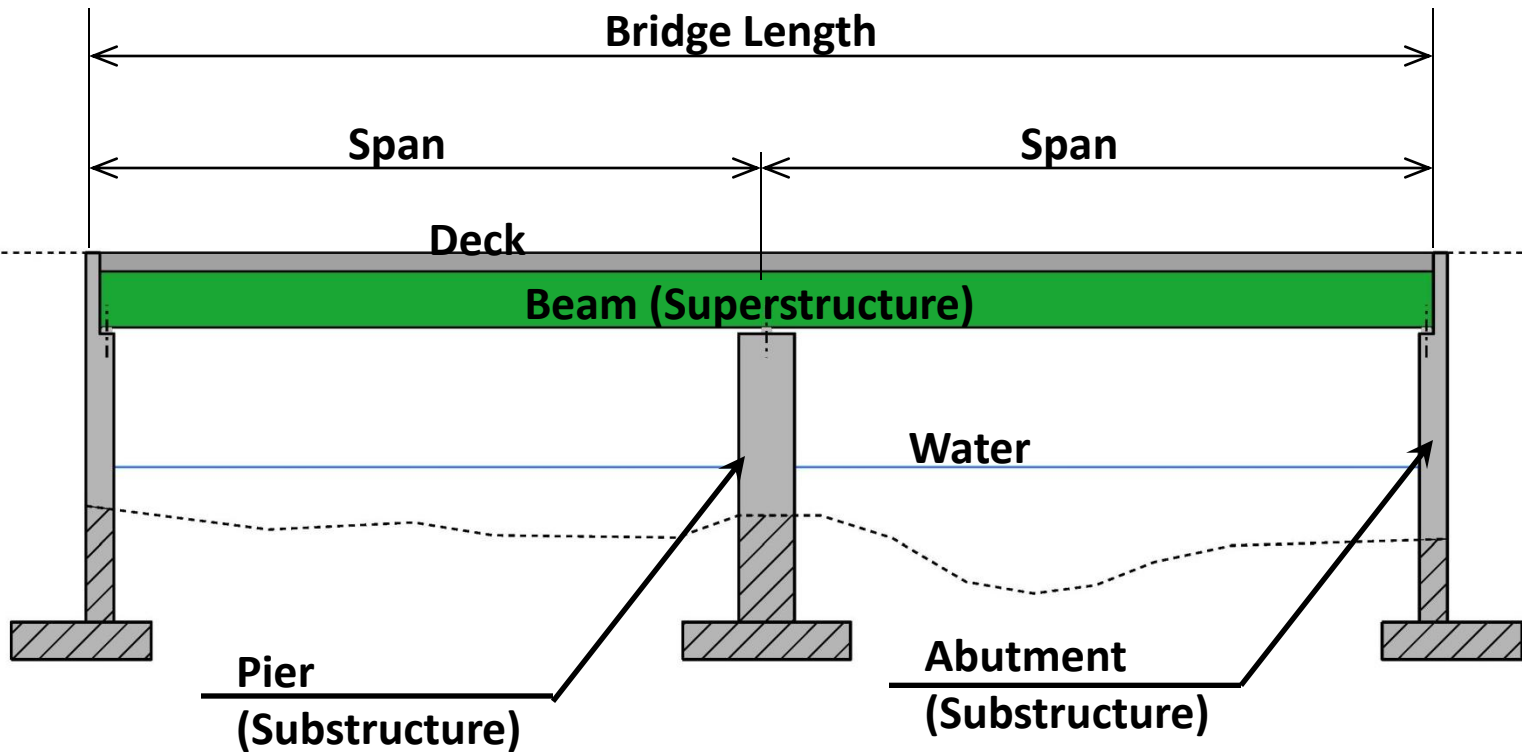
- Develop plans, estimate and specifications

Description of Terms Used



Cross Section of Bridge

More Terms Used



Elevation View of Bridge

Project Background

- The structure is owned and maintained by the State
- Funding will be 80/20 Federal/State (no local funds)
- Functionally labeled as an Urban Minor Arterial
- Posted Speed = 35 mph (Design Speed)
- Existing bridge is a three-span steel beam w/ concrete deck
- Bridge length = 129 feet (42' maximum span)
- Bridge Width = 25 feet (curb-curb with 5' sidewalk)
- The bridge was built in 1936 (77 years old)

Traffic Data

	“Current Year” 2016	“Design Year” 2036
Average Annual Daily Traffic	820	860
Design Hourly Volume	85	90
Average Daily Truck Traffic	20	30
%Trucks	1.6	2.2

EXISTING BRIDGE DEFICIENCIES

Inspection Rating Information (Based on a scale of 9)

Bridge Deck Rating	4 Poor
Superstructure Rating	4 Poor
Substructure Rating	5 Fair

Rating Definitions

9 Excellent
8 Very Good
7 Good
6 Satisfactory
5 Fair
4 Poor
3 Serious
2 Critical
1 Imminent Failure

Deficiencies

- The deck and superstructure are in poor condition with holes in the deck and section loss in the beams
- The bridge and approaches are too narrow for the roadway classification and design speed
- The bridge railing is substandard
- The substructure is only in Fair condition

Looking west over Bridge



Pier deterioration at beam support



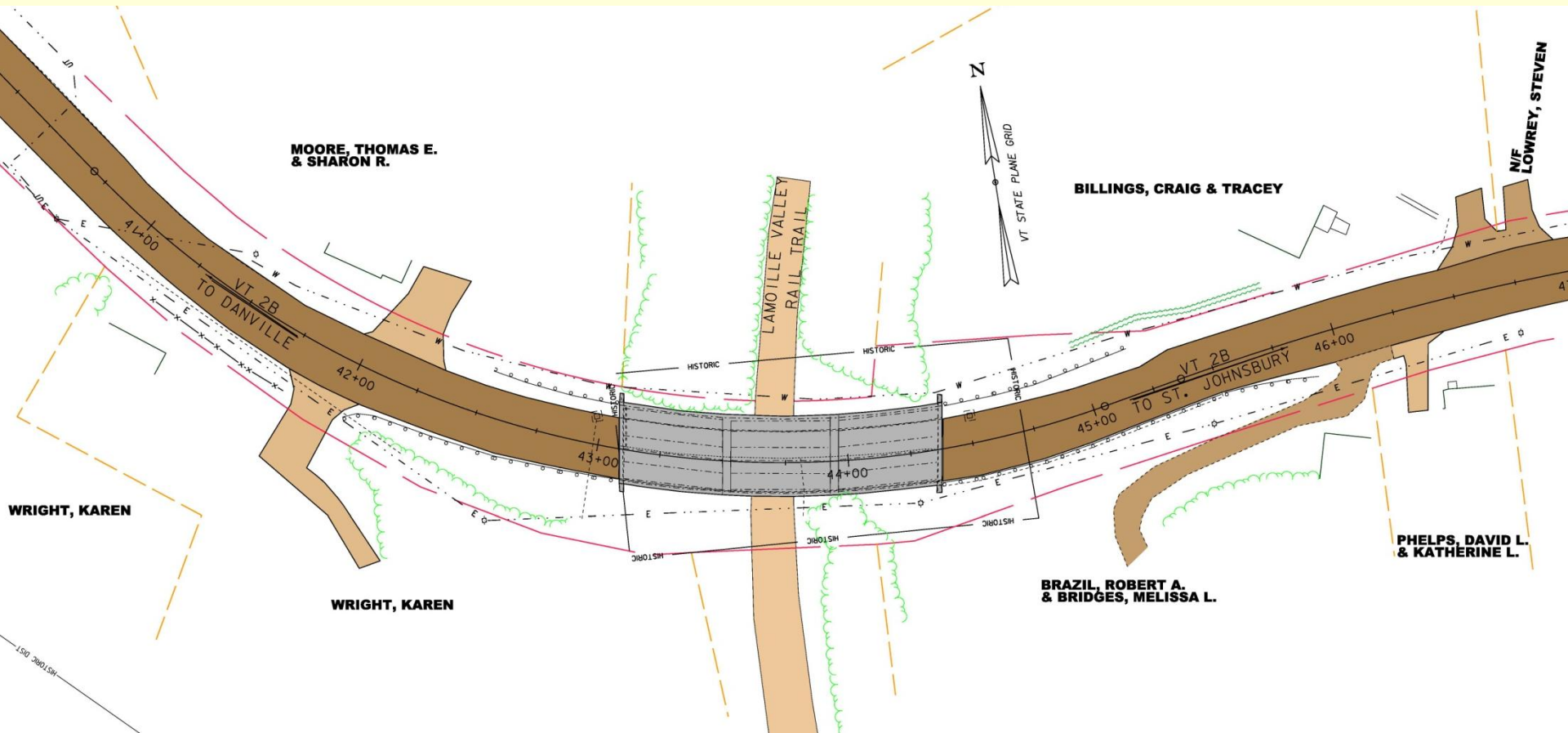
Looking under the bridge at deck and beams



Layout Showing Constraints

Constraints present

- Right of Way – State & Railroad
- Historic Bridge & District
- Utilities – Overhead & Underground



Alternatives Discussion

- Considered closing the bridge permanently
- Considered an at-grade trail crossing
- Rehabilitation was ruled out due to the deteriorated condition of the existing bridge
- Rehabilitation was not detailed in the Scoping Report

Full bridge replacement is the only alternative considered in this study

Note: The method to maintain traffic during construction will be considered separately later in the presentation

Replacement Alternatives

Alternatives Considered

1. Rigid Frame

- 25' span and 35' long barrel length

2. Integral Abutment Bridge

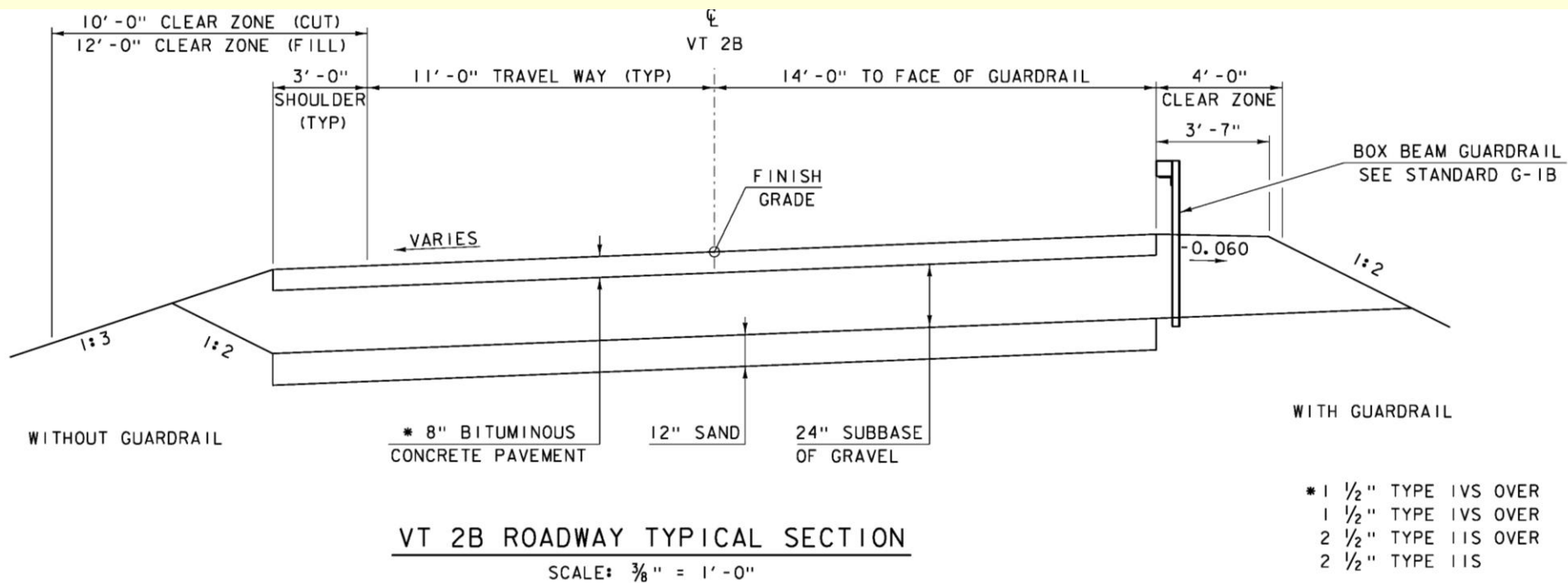
- 75' span w/ no skew
- PBUs or NEXT beam bridge type (determined later)
- Abutment cap on single row of steel H-piles

Common details for replacement alternatives

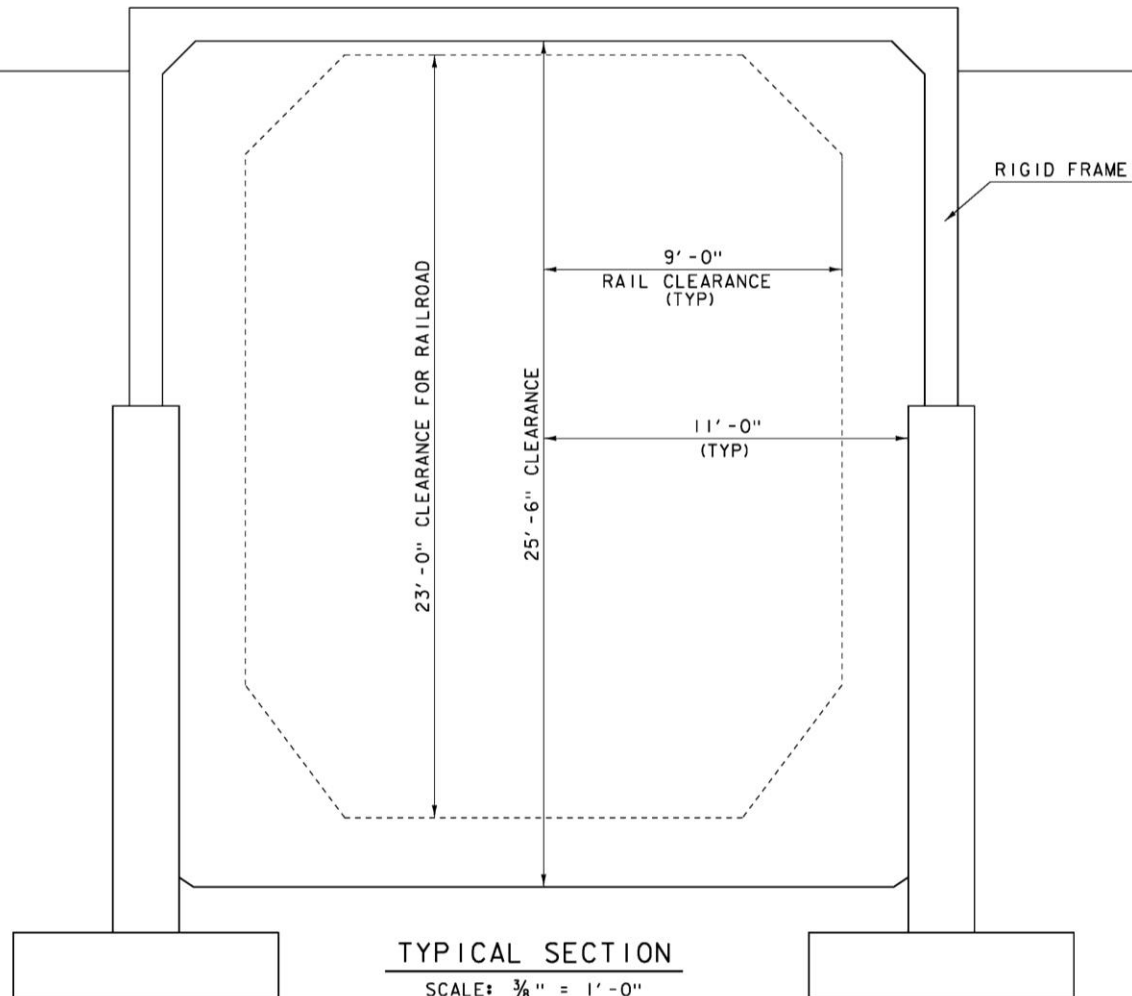
- 28' width between face of rail (3'-11'-11'-3')
- Existing sidewalk will be eliminated
- Same vertical alignment
- Long term (80 year) solution

Roadway Typical

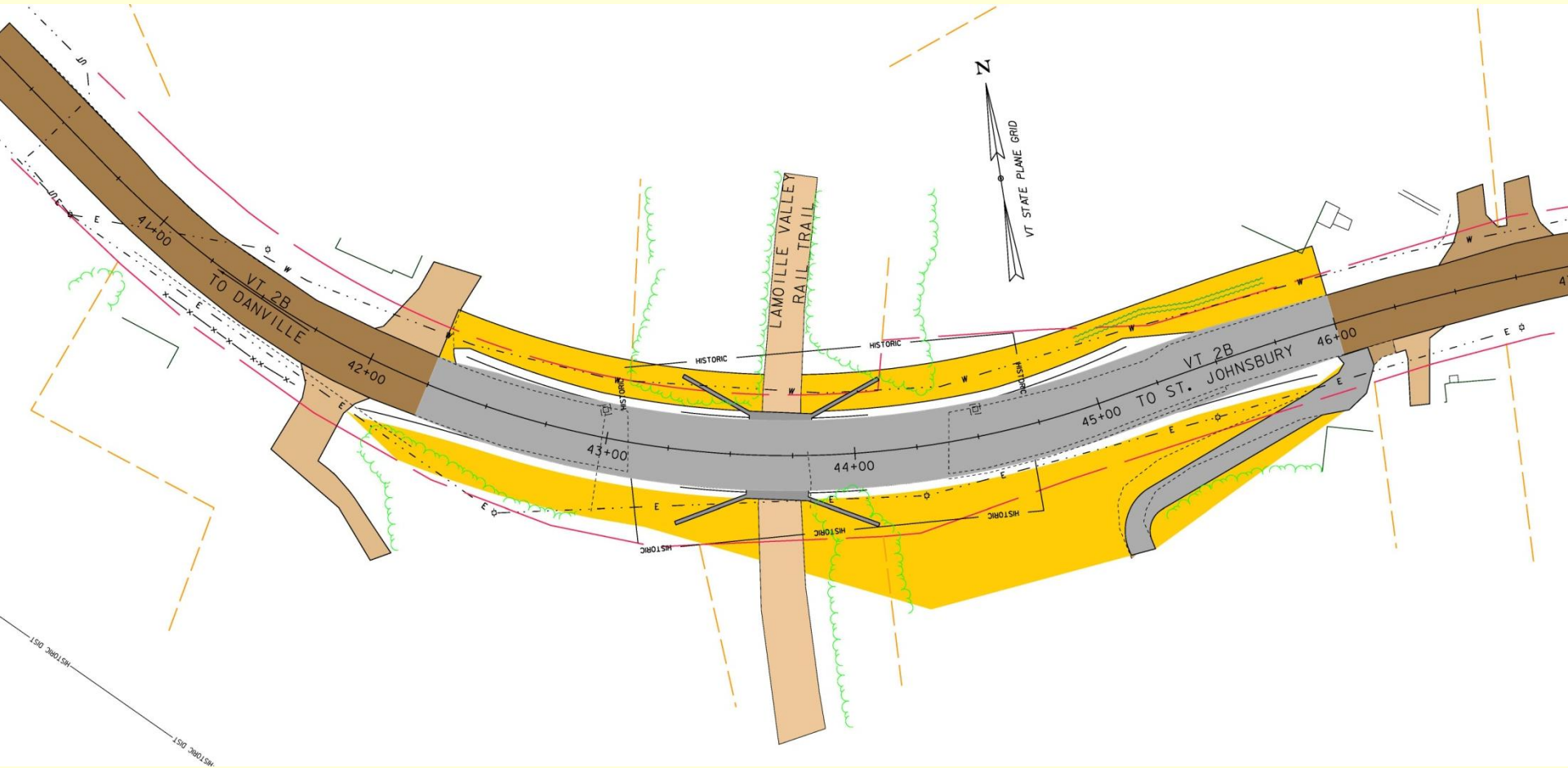
Same for Both Alternatives



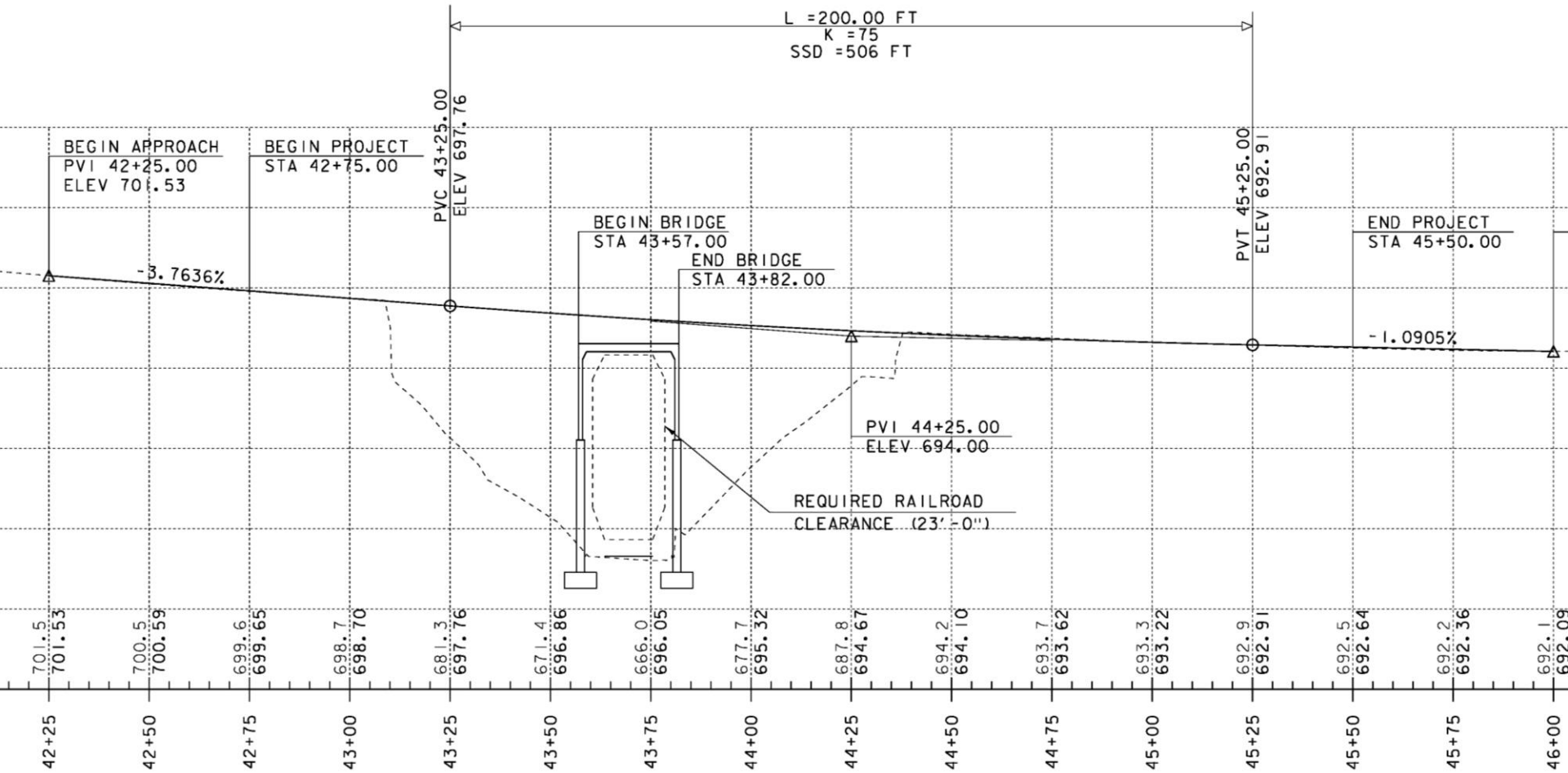
Rigid Frame Typical Section



Layout – Rigid Frame

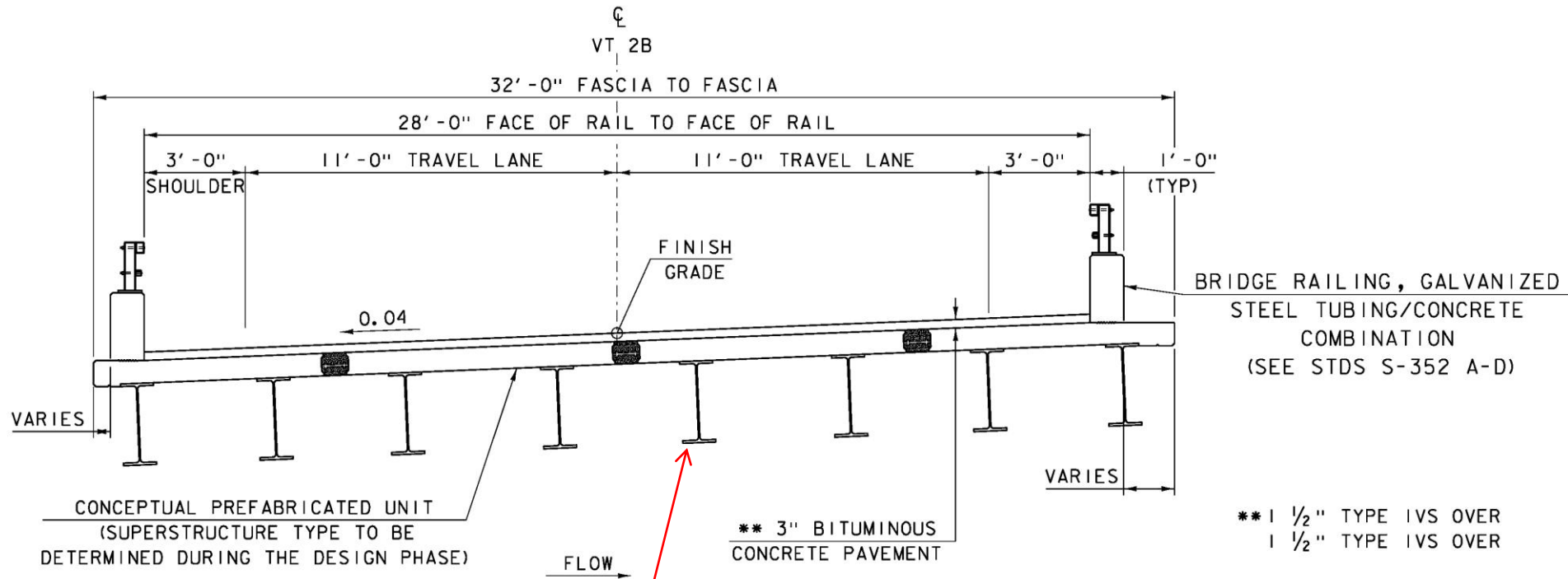


Profile - Rigid Frame



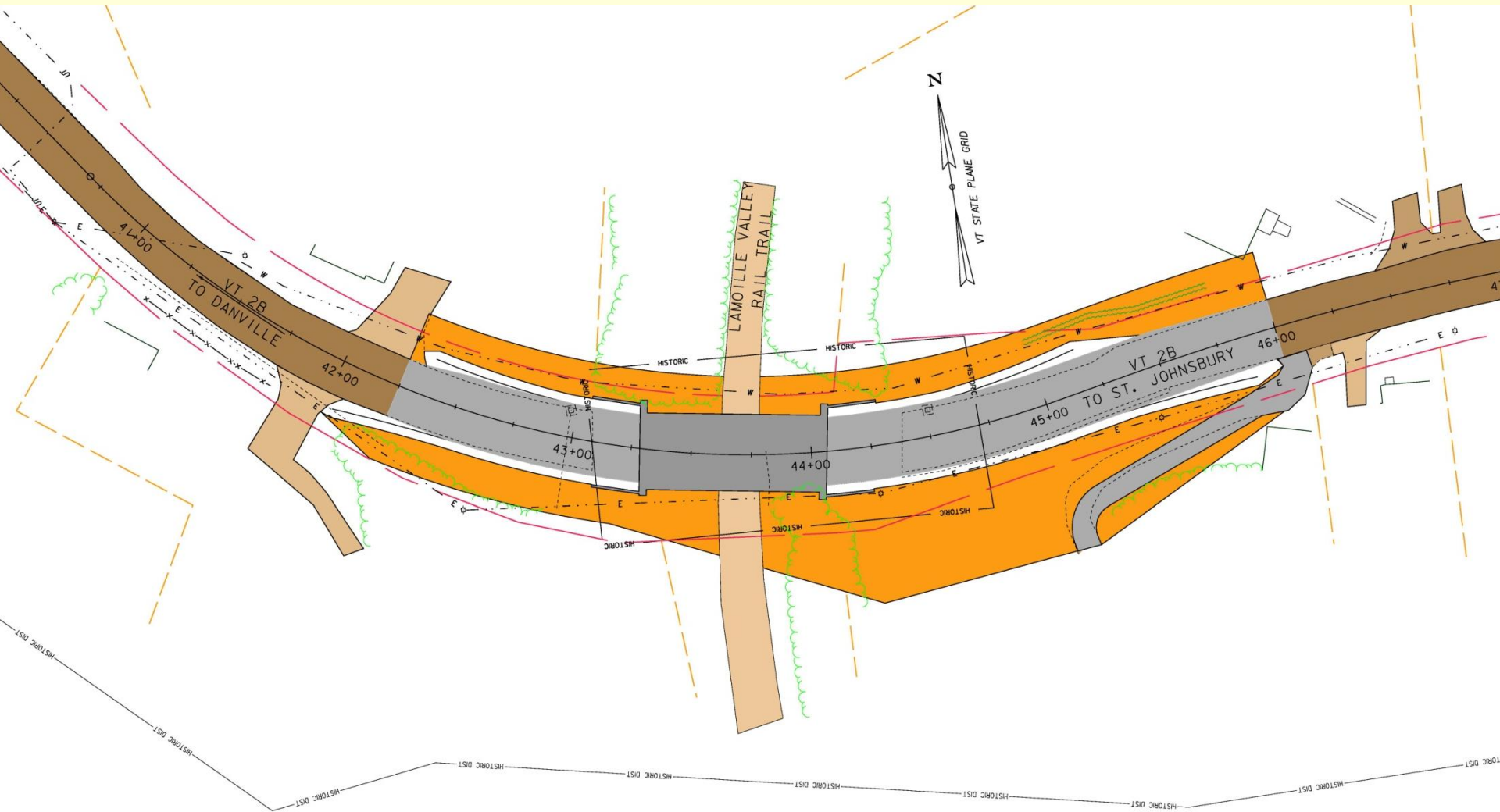
Integral Abutment Bridge

Typical Section

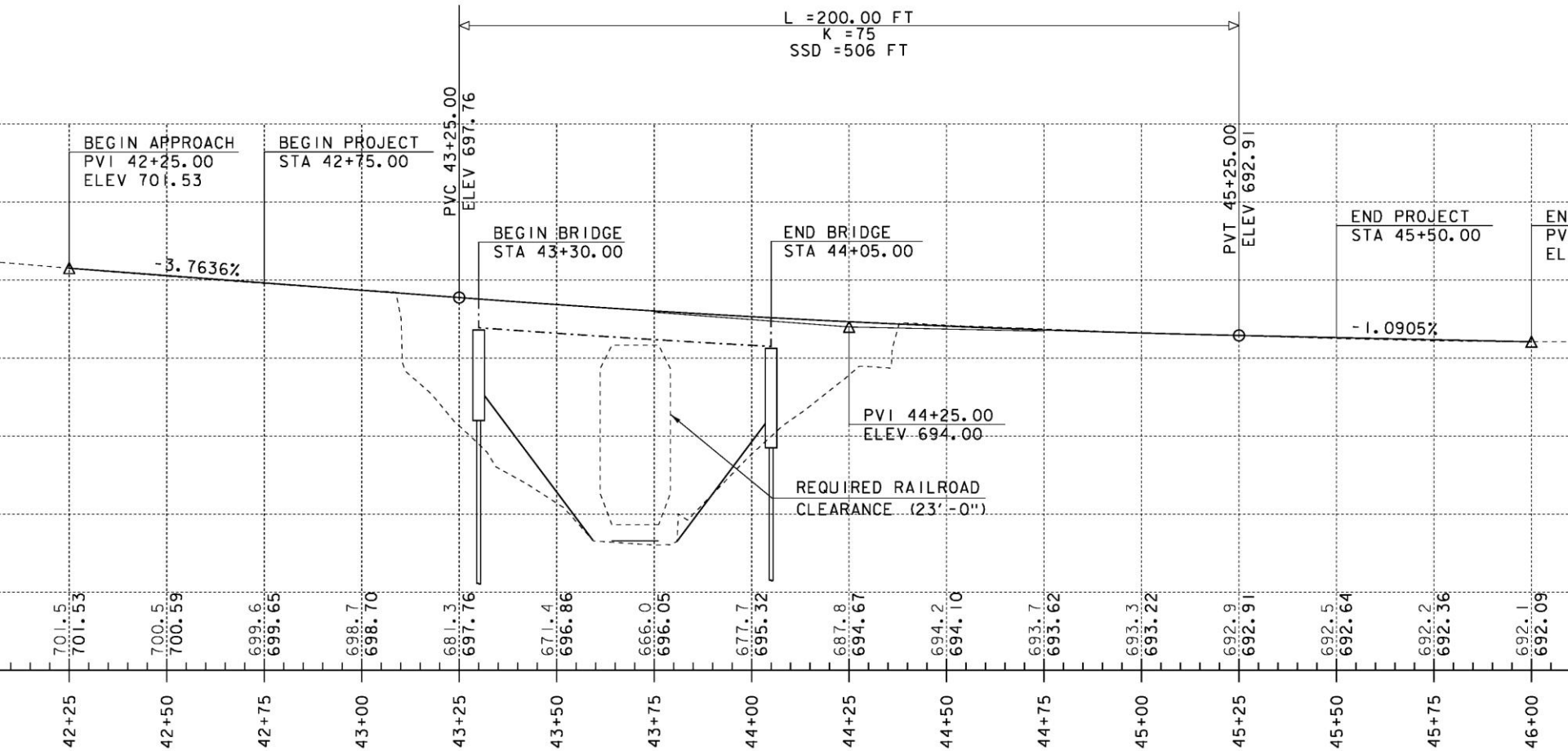


**Superstructure will be Steel Beams
w/ Concrete deck or precast
Concrete NEXT beams (TBD later)**

Layout – Integral Abutment Bridge



Profile - Integral Abutment Bridge



Methods to Maintain Traffic

Three general methods available:

- Phased Construction
- Temporary Bridge
- Short-term bridge closure w/ off-site detour & ABC

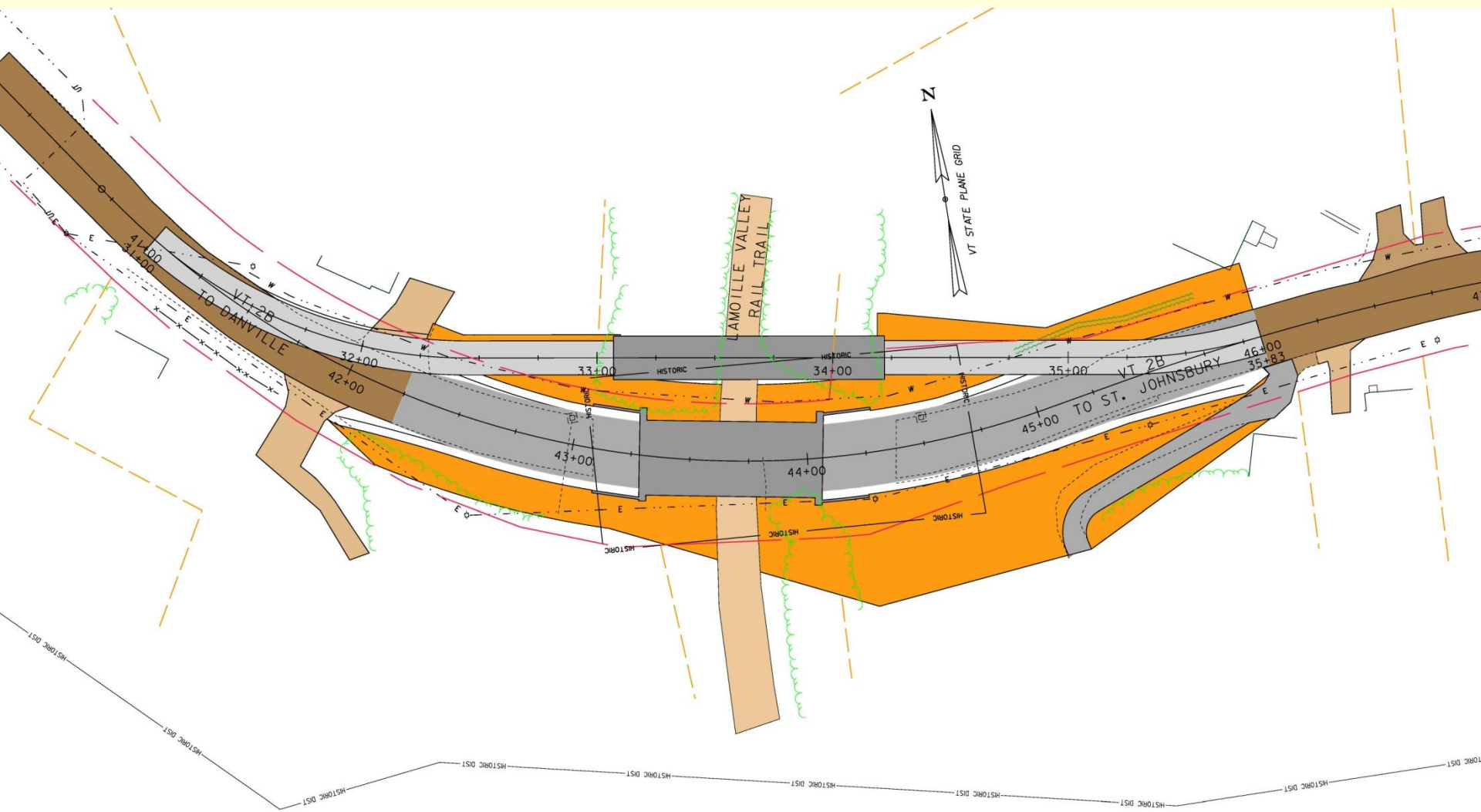
Phased Construction Option

- Build half new bridge while traffic is on half of old bridge
- Switch traffic on new bridge portion
- Build remainder of new bridge
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Relatively long construction duration
- Workers & motorists in close proximity – safety concerns
- Can usually be done without ROW acquisition
- Would require building wider than required or shifting the alignment due to the width of the existing bridge-

Temporary Bridge Option

- Construct temporary bridge to maintain traffic
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Very long construction duration
- Right-Of-Way acquisition is necessary
- Environmental impacts are increased
- Property owner impacts are increased
- Project Delivery time increased
- Project Costs increased-

Layout - Temporary Bridge



Accelerated Bridge Construction with Bridge Closure Option

- Bridge 6 to be closed for 6 weeks (or 8 weeks depending on alternative selected)
- Allow 24/7 construction during bridge closure
- Contract incentives/dis-incentives to encourage contractor
- Contractor will receive more \$ if closure is less than stated in the contract
- Community would have input on time of closure (between June 1 and September 1)
- Detour would be on State highways
- Public Outreach to provide advance notice for planning-

Detour Route



A to B on Thru Route: 3.4 Miles
A to B on Detour Route: 4.4 Miles
Added Miles: 1.0 Miles
End to End Distance: 7.8 Miles

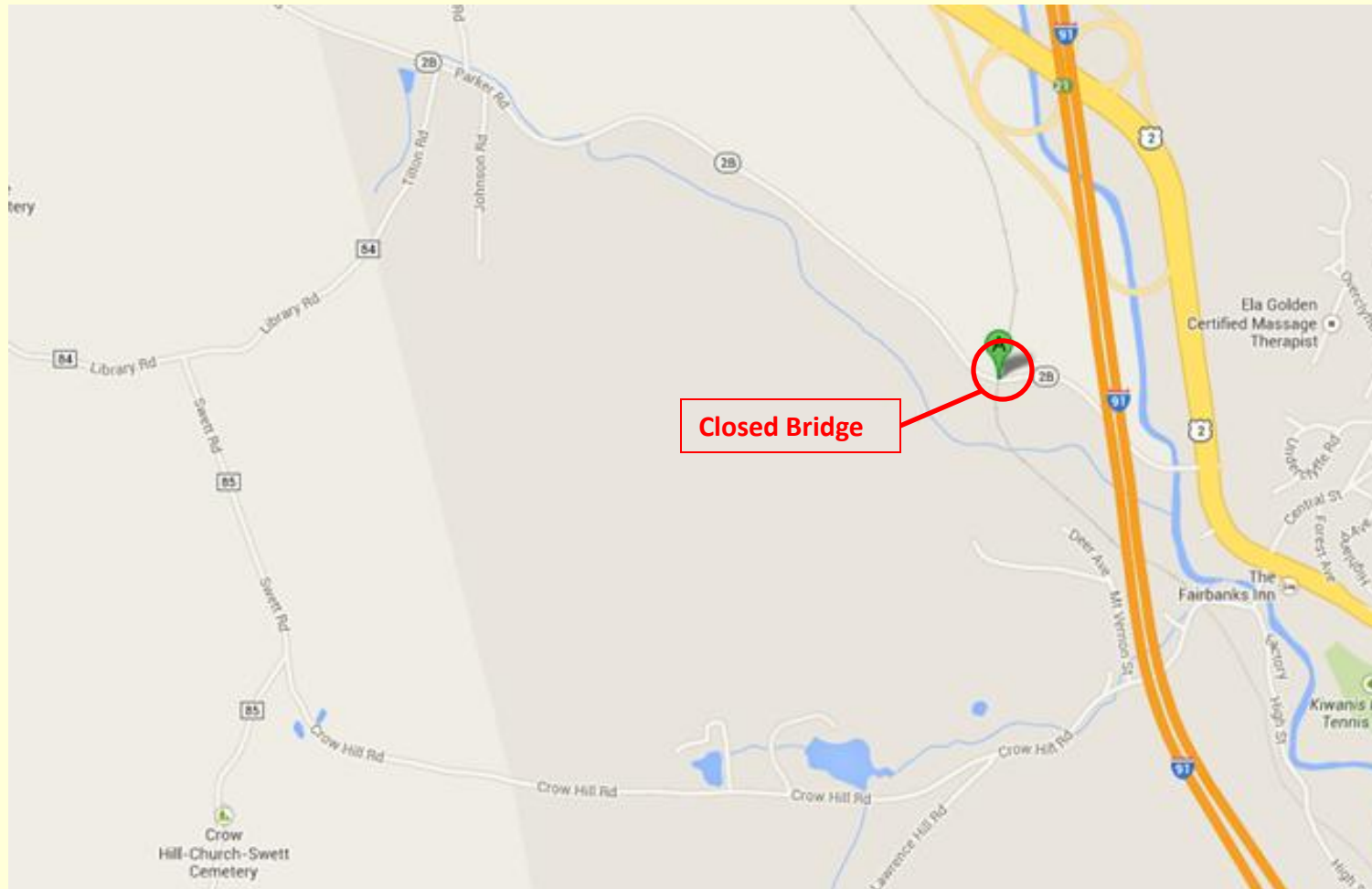
Major Factors

Added Miles: 1.0
Traffic Volume: 820 vpd
Duration: 6 weeks (or 8 weeks)

Local Bypass Details

- A local bypass route is the most likely route to see an increase in traffic during the bridge closure other than the detour route
- No local routes would be appropriate for the detour route
- Local bypass route would not be considered the detour route
- State would not add signing on any local roads
- Route could be used for emergency response as appropriate
- We are in the process of developing a way to fairly and consistently compensate Towns for impacts due to increased traffic on bypass routes
- Compensation amount would mitigate for:
 - Providing police presence to deter speeding
 - Providing enforcement to enforce weight limits
 - Dust control
 - Roadway Maintenance

Local Bypass Map



Tilton Road – Library Road – Swett Road – Crow Hill Road

This route could be used by cyclists during a closure or by emergency responders

Concerned Stakeholders for Bridge Closures

A few groups we commonly hear concerns from:

- Businesses who lose drive-by traffic during the closure
- Schools who have a bus route over the closed bridge
- Motorists who have to travel a longer distance on the detour
- Emergency responders who have to respond quickly
- Owners living near the construction who are concerned with noise
- Owners living along a bypass route that will see increased traffic
- Municipalities who have increased impact to their local roads

Mitigation Strategies for Bridge Closures

Some ideas on how these impacts are often mitigated:

- Allow municipality input on time of year for closure
- Accelerated construction duration including:
 - Allowance for working 24 hours per day and 7 days per week
 - Incentive/Dis-incentive clause to encourage the contractor (\$\$)
- Noise limits included in contract for night time work
- Municipalities are compensated for bypass impacts
- Signing to notify motorists of business districts open for business
- Grant assistance from Agency of Commerce & Community Development
- Many examples of creative solutions from people impacted-

Alternatives Matrix

	Rigid Frame w/ Detour	Rigid Frame w/ Phased	Rigid Frame w/ Temp Bridge	Integral Abut w/ Detour	Integral Abut w/ Phased	Integral Abut w/ Temp Bridge
Construction w/ CE + Contingencies	\$976,300	\$1,123,200	\$1,262,300	\$1,422,200	\$1,614,600	\$1,708,200
Preliminary Engineering	\$187,800	\$216,000	\$242,800	\$273,500	\$310,500	\$328,500
Right of Way	\$86,400	\$86,400	\$97,100	\$86,400	\$86,400	\$97,100
Total Project Cost	\$1,250,500	\$1,425,600	\$1,602,200	\$1,782,100	\$2,011,500	\$2,133,800
Design Life	80 Years	80 Years	80 Years	80 Years	80 Years	80 Years
Project Development Duration	> 4 years	> 4 years	> 4 years	> 4 years	> 4 years	> 4 years
Construction Duration	6 months	12 months	18 months	6 months	12 months	18 months
Closure Duration	6 weeks	None	None	8 weeks	None	None

Conclusion and Recommendation

Alternative Selection

Full Bridge Replacement w/ Rigid Frame

- Lowest Cost
- Shorter bridge closure period
- Long term (80 year) fix

Traffic Maintenance Method

Bridge closure w/ off-site detour & ABC

- Short detour route
- Safest alternative
- Minimal property owner and environmental impacts

Next Steps

This is a list of a few important activities expected in the near future and is not a complete list of activities.

- Meet to discuss comments from this public meeting
- Decide how to proceed and document
- Develop Conceptual Plans
- Historic permitting process
- PROJECT DEFINED milestone
- Develop Preliminary Plans
- Environmental permitting
- Utility relocation

Questions



Direct any questions to:

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**This presentation is available at the
web address shown below**

<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/86E048>